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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,640	11/26/2003	Abdalmajeid M. Alyassin	140306	7321
41838 7590 01/22/2007 GENERAL ELECTRIC COMPANY (PCPI) C/O FLETCHER YODER P. O. BOX 692289 HOUSTON, TX 77269-2289			EXAMINER BITAR, NANCY	
			ART UNIT 2624	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/22/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/722,640

Applicant(s)

ALYASSIN ET AL.

Examiner

Nancy Bitar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 12-20 is/are rejected.
- 7) ☐ Claim(s) 9-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 03/01/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 U.S.C. § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-8 and 12-20 are rejected under 35 U.S.C. § 102(e) as being anticipated by Wang et al. (US 7,103,205).

As to independent claim 1, Wang et al teaches a method for multi-modality registration using virtual cursors (FIGS. 2 and 4 are conceptual diagrams intended to communicate, in a simplified hypothetical setting, the analytical assistance that an overlay of two medical images of two different modalities can provide, column 8, lines 36-39), the method comprising: receiving a two-dimensional image dataset for an object at a first position (first medical image 200, column 8, line 40);

receiving a three-dimensional image dataset for the object at the first position (second medical image 300, column 8, lines 42), said three-dimensional image dataset including a plurality of image slices (note that a thick slice image is an integration of a plurality of substantially parallel individual ultrasound slices, column 7, lines 65-67);

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registering the two-dimensional image dataset with the three-dimensional image dataset without taking into account a magnification factor(bimodal medical image 400 formed by superposition of the medical images 200 and 300, column 8, lines 43-45, note that images are superimposed and displayed in fixed registration with each other);

receiving a user cursor position for a location in the two-dimensional image dataset (cursor 502; figure 5, In frame (a), the user first moves a cursor 502 over a particular ultrasound thick-slice thumbnail of interest. In frame (b), upon clicking the thick-slice thumbnail, the thumbnail is expanded to a full ultrasound thick-slice image 504 having the same spatial scale as the x-ray mammogram image 128, column 9, lines 36-39);

receiving a slice of interest in said three-dimensional image dataset said slice of interest selected from said plurality of image slices (suspect regions 202,302, figure; note that a thick slice image is an integration of a plurality of substantially parallel individual ultrasound slices, column 7, lines 65-67). Moreover, Wang et al teaches a cursor position for a location in the three-dimensional image dataset (the user first moves a cursor 502 over a particular ultrasound thumbnail of interest, column 9, lines 38-40) and a magnification factor corresponding to the shadow cursor position for the slice of interest (spatial scale increased to same scale as x-ray mammogram image, 606,column 10, lines 1-4; figure 6) and outputting the shadow cursor position (multiple artificial markers are used the scaling of the component images may be contracted or expanded in one or both directions as necessary to get all the markers lines up, column

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10, line 22-26, note that the user may optionally perform mixing parameters adjustments as described in figures 13-14).

As to dependent claim 2, Wang et al teaches the method of claim 1, further comprising displaying the two-dimensional image dataset on a display device and displaying the slice of interest adjacent to the two-dimensional image dataset on the display device (FIG. 10 illustrates an adjunct ultrasound display according to a preferred embodiment displaying a digital x-ray mammogram adjacent to the ultrasound thick-slice image of FIG. 9, column 9, lines 39-44 and column 11, lines 33-41).

As to dependent claim 3, Wang et al teaches the method of claim 2, further comprising: displaying a user arrow at the user cursor position on the two-dimensional image dataset (cursor 502, column 9, lines 36-57); and displaying a shadow arrow at the shadow cursor position on the slice of interest (artificial markers are used on display monitor 126, column 10, lines 23-26).

As to dependent claim 4, Wang et al teaches the method of claim 1, wherein the two-dimensional image dataset is acquired using an x-ray source and a detector (x-ray mammogram, figure 2).

As to dependent claim 5, Wang et al teaches the method of claim 1, wherein the three-dimensional dataset is acquired using an ultrasound probe (ultrasound probe 116, column 6, lines 49-56, figure 3).

As to dependent claim 6, Wang et al teaches method of claim 1, wherein said registering is performed during data acquisition (raw ultrasound data is processed into

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adjunctive ultrasound data that will be made available to the screening radiologist, column 7, lines 30-43).

As to dependent claim 7, Wang et al teaches method of claim 1, wherein said registering includes mechanical registration (Any of a variety of mechanism may be used to physically move/overlay the medical images and to provide manual vernier adjustment capability, ranging from hand manipulation of hardcopy images to computerized click-and-drag techniques, column 4, lines 48-52).

As to dependent claim 8, Wang et al teaches method of claim 1, wherein said registering includes longitudinal registration (a plurality of x-ray mammogram images taken at different points in time can be superimposed with a plurality of thick-slice ultrasound images taken at different points in time, column 13, lines 52-57; note as applicant discloses in specification paragraph [0024] that longitudinal registration may be utilized when subject is scanned at different times or moved during the scanning )

The limitation of claim 12 has been addressed above in claim 1 instead for the following receiving a user cursor position for a location in the slice of interest in said three-dimensional image dataset; calculating a shadow cursor position for a location in the two-dimensional image dataset. Wang et al teaches that limitation in column 10, lines 23-26 where the component images may be contracted or expanded in both directions to get all the markers line up and the cursor is on the ultrasound image which is a 3-dimensional image, column 9, lines 36-49).

Claims 13-19 differs from claims 1-8 only in that claim 13-19 are system claims whereas, claims 1-8 are method claims. Thus, claims 13-19 are analyzed as previously discussed with respect to claims 1-8 above.

Claims 20 differ from claims 12 only in that claim 20 is a computer program claims whereas, claims 12 is a method claims. Thus, claims 20 is analyzed as previously discussed with respect to claims 12 above.

### ***Allowable Subject Matter***

Claims 9-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shmulewitz et al (US 5,983,123) is cited to teach a combined ultrasonic and an X-ray imaging system that provides registered X-ray and ultrasound images

Dines et al (US 2003/0167004) is cited to teach computer operable connected to the ultrasound probe and to the x-ray tube; and receiving the ultrasound image data and the x-ray data with the computer.

### ***Inquiries***

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nancy Bitar whose telephone number is 571-270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nancy Bitar

01/12/2007

JINGGE WU  
SUPERVISORY PATENT EXAMINER

